UNIVERSITY OF ILLINOIS
DEPARTMENT OF BACTERIOLOGY
362 NOYES LABORATORY OF CHEMISTRY
URBANA

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Dr. Joshua Lederberg
Department of Genetics
University of Wisconsin
Madison, Wisconsin

Dear Joshua,

I have not heard as yet from Lardy so I guess he still does not know anything definite about the fellowship. I hope that I will hear soon.

According to what you suggested in our last conversation, I will describe below the work I would like to do for the first two or three months in Madison. I believe that after this period, I will find some interesting project using either some of the ideas you proposed or others that I would like to discuss with you.

During my thesis work, I found that yeast extracts prepared in a special way, or boric acid to a minor extent, when incubated with yeast cells were capable of transforming the majority of the cells from galactose-negative to positive, all the process occurring in the absence of significant growth (at the most 0.4 generations). The cells used were S. chevalieri which exhibit the phenomenon of long term adaptation. You might recall that these cells when grown in absence of galactose lose the galactose-positive phenotype after seven divisions in an abrupt manner; this we call reversion. If we accept that this reversion is due to a dilution, among the progeny, of cytoplasmic particles which control the enzymatic phenotype, the reversion time would be a direct measure of the number of these particles in the cell. In my experiments, I found that positive cells obtained immediately after transformation have a reversion time of three generations. If these cells are subsequently incubated in synthetic medium containing galactose for about two hours, the reversion time becomes the normal reversion time of a positive, that is, seven generations. The interesting point is that these transformed positives with a full reversion time lack entirely galactokinase (measured in extracts) and the intact cells are not able to ferment galactose.
I think that this is a very good case of separation of the enzyme forming system from the enzyme and perhaps it will be a valuable tool to gain more information about the former. I would like to repeat the observations I have described to you in a more critical manner and in a similar way for the galactose-waldenase. By that time we will be familiarized with the system and its potentialities and we will be in the position to design experiments concerning the nature of the enzyme forming system.

I will be glad to hear any suggestions or criticisms you may have.

Best regards to Esther and you,

Sincerely yours,

Boris

Boris Rotman

BR:oz